

der cultivation, was flooded. The levee protected a piece of country forty miles long by from four to ten miles wide. Three persons were drowned. Much stock was lost and great damage done to corn and hay, the wheat having generally been harvested. Estimated loss over one hundred thousand dollars. *Oregon and Washington Territory*, 27th to 30th, lower part of Portland, Oregon, flooded; many streets and stores flooded; much damage to growing crops in lower Columbia and Willamette valleys. 30th, the bottoms between Clackamas river and Oregon City overflowed, doing much damage. Sauvie Island and Columbia slough and all farms on west bank of Willamette river completely submerged. The town of Freeport, W. T. and all surrounding flat country under water, driving residents to the hills for safety. The whole country around Monticello, W. T., submerged, doing much damage to growing crops. 28th to 30th, three miles of railway, between The Dalles and Celilo, under water. 29th, unprecedented flood in Cowlitz's river, W. T., water three feet higher than ever before known. At railroad bridge, twenty miles above its mouth, river sixteen and a-half feet above low water. Northern Pacific railway, between Kalama and Cowlitz, under water for a distance of fifteen miles. Lewiston, Idaho, 27th, Snake river four inches above extreme high water of 1876. 30th, Wallula, W. T., river at a stand, one foot and eleven inches below high water of 1876. Skagit river, W. T., (no date given) higher than ever before known. The dike on the river broke, doing great damage to crops. June 30th, at Portland, Or., river reached twenty-seven feet four inches, (within one inch of high water of 1876,) overflowing Front and First streets, doing many thousand dollars worth of damage. The Dalles, Or., 26th, to 28th, all of Front street under water, flooding the principal hotels and stores of the city. 28th, river above high water of 1871 and near that of 1876; greater part of railway track under water; loss and damage by flood very great.

Droughts.—*New Jersey*, exceedingly severe in Bergen, Passaic and Essex Counties. 30th, Hackensack and Mount Claire, water for domestic purposes very scarce. Atco, very dry, crops much injured, wells failing. Somerville, drought for past two months, very injurious to hay. Freehold, very dry, crops suffering. *New Hampshire*, 13th to 20th, Auburn, very severe. *New York*, 30th, Hector, drought very severe. White Plains, "drought commenced on last day of April and has continued to July 1st, during which time (62 days,) only 1.43 inches of rain fell; all vegetation is suffering severely." *Georgia*, 23rd, Augusta, very severe, injuring gardens and crops. *Kansas*, 15th, Creswell, small streams nearly all dry. *Maryland*, 29th, Sandy Springs, wheat crop very poor, owing to severe drought. *Massachusetts*, 26th, Springfield, vegetation suffering. Connecticut river very low, only 13 inches above low water.

Rain-fall During May, Received too late to be used in May Review.—*Arizona*: Whipple Barracks, Ft. Lowell, Ft. Bowie, Ft. McDowell, Ft. Verde, Ft. Apache and Ft. Mojave, 0.00; Wickenburg, 0.17. *California*: Benicia Barracks, 0.84; Angel Island, 1.14; Alcatraz, 0.95; Presidio, S. F., 0.88; Ft. Yuma, 0.00; Ft. Gaston, 3.48; Ft. Bidwell, 1.38. *Colorado*: Ft. Lyons, 1.09. *Dakota*: Ft. Randall, 6.21; Ft. Stevenson, 3.29; Ft. Sisseton, 3.50; Ft. Sully, 1.88; Ft. Totten, 4.38; Ft. Hale, 3.68. *Idaho*: Ft. Lapwai, 2.40. *Montana*: Ft. Benton, 1.54; Ft. Shaw, 2.36; Ft. Ellis, 7.13; Ft. Logan, 2.58; Ft. Assiniboine, 0.79. *Nebraska*: Camp Sheridan, 1.60. *Nevada*: Ft. McDermitt, 0.39; *Oregon*: Ft. Stevens, 4.91; Ft. Klamath, 1.24; Ft. Harney, 0.72. *Texas*: Rio Grande City, 1.64; Brownsville, 1.56. *Washington Ty.*: Ft. Canby, 5.22; Ft. Townsend, 2.20; Neah Bay, 6.62; Bainbridge Island, 3.20. *Wyoming*: Ft. Fred. Steele, 0.78.

RELATIVE HUMIDITY.

The percentages of mean relative humidity for the month range as follows: New England, from 62 to 86; Middle Atlantic States, 57 to 87; South Atlantic States, 57 to 80; Eastern Gulf States, 65 to 77; Western Gulf States, 68 to 73; Ohio valley and Tennessee, 61 to 72; Lower Lake region, 63 to 73; Upper Lake region, 68 to 81; Upper Mississippi valley, 63 to 69; Missouri valley, 62 to 69; Red River of the North valley, 75; Eastern Rocky Mountain Slope, 20 to 68; Rio Grande valley, 49 to 74; Plateau districts, 17 to 43; California, 36 to 76; Oregon, 39 to 63. *High stations* report the following averages not corrected for altitude: Pike's Peak, 48.2; Mt. Washington, 82.3 per cent.

WINDS.

The prevailing direction of the wind during the month of June, 1880, is shown, by arrows flying with the wind, on chart No. II. The prevailing direction along the entire Atlantic slope and in the Lake region was southwest; in the great central valleys south; in Texas southeast. To the westward of 102° W. the prevailing direction was northerly to the northward of the parallel 40°, and southwesterly to the southward of that parallel. The prevailing directions on Mt. Washington NW., and Pike's Peak SW., were normal.

The maximum velocities per hour are generally given in the description of the areas of low pressure. The following are the maximum velocities exceeding 50 miles per hour that have been reported during June, 1880: Madison, Wis., 50 S.; St. Louis, 52 S.; Dodge City, 52 NW.; Kittyhawk, 52 NE.; Delaware Breakwater, 54 NW.; Breckenridge, 56 NE.; Portsmouth, N. C., 56 NW.; Omaha, 60 NW.; North Platte, 62 N.; Cape Henry, 64 NW.; Mt. Washington, 70 NW., and Pike's Peak, 72 SW.

Total Movements of the Air.—The following are among the largest total movements in the various districts: Pike's Peak, 12,978; Cape Lookout, 12,940; North Platte, 12,580; Fort Stockton, 10,581; Delaware Breakwater, 9,643; Umatilla, 9,136; San Francisco, 9,098; Indianola, 8,453; Sandusky, 8,363; Milwau-

kee, 8,199; Bismarck, 7,932; Wood's Holl, 7,392; St. Louis, 7,113; Cedar Keys, 6,875; Cairo, 5,874. The record on Mt. Washington is incomplete owing to the frost work. The *smallest* are: Atlanta, 1,669; La Messilla, 1,743; Lynchburg, 2,364; Roseburg, 2,486; Deadwood, 2,971; Springfield, Mass., 3,021; Los Angeles, 3,185; Nashville, 3,270; Little Rock, 3,958; Duluth, 4,356; Oswego, 4,368.

Local Storms.—The following account of the tornado at Savoy, Fannin Co., Tex., was received too late for the May REVIEW: About 10 p. m., May 28th, 1880, two large black clouds (one moving from SE. and the other from the NW.) met SW. of the town and formed one funnel-shaped cloud, causing a low rumbling sound to be heard. During the formation, vivid electrical discharges in the shape of large balls of fire, occurred. Pendent from the cloud was a long cylinder which rotated from W. to E. by the south point, and touched the earth continuously during its passage through the town. The track was about 180 yards wide, direction SW. to NE., duration about two minutes. No wind was felt outside the path. The tornado left the earth N. of the town and was not again heard of. Its passage was marked by hail and followed by heavy rain, which continued several hours. Twelve persons were killed and over sixty wounded: some fatally. Every house in the track, 48 in number, was destroyed. The surrounding country is a rolling prairie with no native timber. St. Louis, Mo., June 4th, strong S. wind attaining, at 11 a. m., velocity of 52 miles. The storm was accompanied by thunder, lightning and heavy rain. One person was killed and several injured. Several buildings were unroofed and much damage done to others. Considerable damage was also done south of the city. Pottawattamie Co., Iowa, 10th, during p. m., terrible tornado swept through the southeastern portion of the county, destroying everything in its path, which averaged about a half mile in width. Wind clouds, of very portentous appearance, were first observed forming both in the east and west. In a short time they came together and formed a conical-shaped cloud, which rapidly extended downward to the earth, when the work of devastation commenced. At one place, a farmer's house, surrounded by a frail fence, was carried out of the yard and dashed to pieces, leaving every board of the fence remaining in its place. Twenty persons were killed outright and all buildings literally torn to pieces. The passage of the storm was almost instantaneous: no rain accompanied it. Brownsville, Mower Co., Minn., 11th, very violent wind storm causing great destruction to buildings and fences: one person killed. Sparta, Monroe Co., Wis., 11th, round house of the Chicago and Northwestern railroad blown down and several other buildings demolished. Glendale, Ohio, 14th, 8 p. m., violent wind and rain-storm, passed through the village from SW. to NE. Scarcely a dwelling remained uninjured: scores of the largest trees either uprooted or twisted off near the ground. Many of the largest buildings were torn to pieces and heavy objects carried long distances. Loss to buildings estimated at \$80,000. Near Springdale, the damage was proportionately severe, 15 buildings were either badly injured or completely destroyed and several animals killed. At Evendale six buildings were wrecked and five animals killed. In the vicinity of Montgomery, several buildings destroyed, and scores of trees uprooted or twisted off. At Venice and Symmes Corner, Butler Co., the destruction was particularly severe, acres of timber were shorn of their branches, fields of grain in the shock were scattered in every direction, large orchards were completely destroyed, dwellings and out-buildings were either unroofed or entirely blown down. Between 50 and 60 buildings were badly injured or destroyed and several animals killed. The heavy iron bridge, 113 feet long, spanning Indian Creek, was whirled from its abutments. Two other heavy bridges in the vicinity were similarly destroyed. Numerous chickens and turkeys were found dead in the path of the storm, with the feathers completely stripped from their bodies. The noise accompanying the storm was described as terrible, resembling the report of a large cannon in its reverberations. In Morgan township the storm was very severe, buildings, fences and trees were damaged to the extent of about \$20,000. At Miamiville, the storm left the town in ruins. The large covered bridge over the Little Miami river was swept away. Riverside, Del., 12 p. m., violent wind storm causing great damage to peach orchards, several buildings demolished. At Middletown, Del., the roof of the National Hotel was lifted and carried half a mile; many other buildings badly wrecked, and several peach orchards entirely destroyed. Shelbyville, Ind., 14th, p. m., very violent tornado, many buildings destroyed and great damage done to farm property, one person killed. The storm moved from SW. to NE.; path very narrow. New York City, 14th p. m., very heavy wind storm, many buildings unroofed and otherwise injured: storm continued for about fifteen minutes. At Paterson and Newark, N. J., buildings were damaged to the extent of \$25,000.

Waterspouts.—Cape Henry, 12th, 6 p. m., three distinct waterspouts were observed at sea 200 yards from station, moving southeastward with extreme rapidity, disappearing when about two miles below station. The spiral motion in each spout was from left to right. Ft. Barrancas, Fla., 2nd, 10:10 to 10:50 a. m., four miles from shore moving slowly southeastward.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily indications for June, with the telegraphic reports for the succeeding twenty-four hours, shows the general percentage of verifications to be 88.7 per cent. The percentages for the four elements are: Weather, 87.7; Direction of the Wind, 88.5; Temperature, 88.6; Barometer, 90.0 per cent. By geographical districts they are: for New England, 86.6; Middle States, 87.1; South Atlantic States, 92.5; Eastern Gulf States, 91.9; Western Gulf States, 92.6; Lower Lake region, 89.9; Upper Lake region, 86.0; Tennessee and the Ohio valley, 90.4; Upper Mississippi valley, 85.2; Lower Missouri valley, 83.4; Northern Pacific coast region, 77.0; Central Pacific coast region,